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Detlof von Winterfeldt
Director
Center for Risk and Economic
Analysis of Terrorism Events (CREATE)
University of Southern California

Chairman Simmons, Ranking Member Lofgren, distinguished members of the Subcommittee: It is an honor to appear before you today to discuss the topic of terrorism risk assessment.

I'd like to cover three areas in this opening statement. First, I will briefly introduce you to the Center for Risk and Economic Analysis of Terrorism Events (CREATE); second, I'd like to provide some background on risk assessment and its uses in the past 30 years in government agencies and private enterprises; third, I'd like to comment on the uses, opportunities and challenges of risk assessment in the homeland security area.

CREATE is the first university-based center of excellence funded by the Department of Homeland Security. It was selected in a competition of 72 universities and started operations in March of 2004. CREATE is located at the University of Southern California with partners at the University of Wisconsin, New York University and faculty affiliated with the Massachusetts Institute of Technology. CREATE researchers are developing advanced risk assessment models and tools for homeland security decisions. We also study the economic impacts of terrorist events and develop computer models and analysis tools to assist decision makers in government and industry to allocate funds to counter terrorism.

Risk assessment has a long history – dating back to studies of nuclear power plant and spacecraft safety in the mid 70s. Today, risk assessment is successfully applied in areas as diverse as medicine, business, environment, industrial safety and natural disasters. A typical risk assessment answers three questions:

1. What can go wrong?
2. How likely is it?
3. What are the consequences?

In addition, risk assessments examine what can be done to reduce the likelihood of failures and the magnitude of consequences and to evaluate the effectiveness of alternative investments in improving safety. My overall impression is that risk assessments in these applied areas have

been very successful by identifying risks and by developing cost-effective solutions to reduce risks.

The application of risk assessment to terrorism is relatively new providing new opportunities and challenges. Natural and engineered systems are "neutral" agents, who don't seek out our vulnerabilities. In these areas we also have a fair amount of experience and data that can be used to estimate probabilities and consequences. Terrorists, in contrast, are adversaries, who seek out our vulnerabilities and adjust their actions in response to our defenses. This non-random nature of terrorism complicates risk assessments and requires the development of new tools.

In spite of these challenges, risk assessment has made considerable progress in the terrorism area in the past few years. An important distinction in terrorism risk assessment is between threat, vulnerabilities, and consequence. When considering threats, we need to consider the motivation, capabilities, and intent of terrorist groups. This is probably the hardest part of terrorism risk assessment and there are no off-the shelf solutions for this task. CREATE researchers are working together with another university center of excellence – the Center for the Study of Terrorism and Response to Terrorism (START) at the University of Maryland – to develop risk analysis models for this purpose. Assessing vulnerabilities is somewhat easier. The key is to consider a wide range of threats and to assess the probability that an attempted terrorist attack is successful. CREATE researchers are using project risk analysis methods for this purpose. Finally, the assessment of consequences, given a successful attack, is quite straightforward and we can use off-the-shelf methods, for example, for modeling the dispersions of materials, spreading of infectious diseases, and so forth.

Another distinction is between the various levels of homeland security decision making. Recent studies by our CREATE researchers suggest that specific countermeasure decisions, for example regarding MANPADS countermeasures, can be supported quite well with risk assessments. At the next level are decisions on how to allocate funds within a specific threat area or across potential targets. We see some progress in this area as well. For example, in the past few years several commercial risk analysis tools have been developed for assessing risks of infrastructure targets. At the highest decision making level are questions about how much money to spend on, for example, radiological and nuclear defenses vs. biological defenses vs. infrastructure protection. Risk assessment at this level is difficult and will necessarily involve expert judgments and more qualitative analysis.

Overall, I am very optimistic that risk assessment can improve our Nation's decisions to counter terrorism. In other areas it often has taken years from the initial uses of risk assessment to mature applications. I believe that we can do better in making risk assessments useful in the terrorism area, but we also need to be aware of the many challenges we face.